



[6450-01-P]

DEPARTMENT OF ENERGY

Energy Conservation Program for Consumer Products and Commercial and Industrial Equipment: Effect of Revised Estimates of the Social Cost of Carbon

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy.

ACTION: Notice of Data Availability (NODA).

SUMMARY: The U.S. Department of Energy (DOE) has, for several years, used monetary values for the Social Cost of Carbon (SCC) to estimate the value to society of reducing carbon emissions that could result from rulemakings establishing energy conservation standards for residential appliances and industrial equipment. In recent standards rulemakings for microwave oven standby and off modes, metal halide lighting fixtures, commercial refrigeration equipment, walk-in coolers and freezers, and furnace fans, DOE used SCC values developed by an interagency group and released to the public in May 2013 by the Office of Management and Budget (OMB). OMB has issued updated SCC values that reflect minor technical corrections to the estimates that were released in May 2013. The purpose of this notice is to show the impact of these updated values on the national economic benefits projected to result from the proposed standards for commercial refrigeration equipment, walk-in coolers and freezers, metal halide lighting fixtures, and furnace fans.

FOR FURTHER INFORMATION CONTACT: Requests for additional information may be sent to Mr. John Cymbalsky, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Office, EE-2J, 1000 Independence Avenue SW., Washington, DC 20585-0121. Telephone: (202) 287-1692. Email: John.Cymbalsky@ee.doe.gov.

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SUPPLEMENTARY INFORMATION:

I. Introduction

For several years, DOE has used the monetary values provided by the SCC to estimate the value to society of reduced carbon emissions from rulemakings establishing energy conservation standards for residential appliances and industrial equipment. DOE has recently issued standards rulemakings for microwave oven standby and off modes, commercial refrigeration equipment, walk-in coolers and freezers, metal halide lighting fixtures, and furnace fans. DOE issued a final rule for microwave oven standby and off modes standards (78 FR 36316 (June 17, 2013)), and it issued notices of proposed rulemaking (NOPR) for metal halide lighting fixtures (78 FR 51463 (August 20, 2013)), commercial refrigeration equipment (78 FR 55889 (September 11, 2013)), walk-in coolers and freezers (78 FR 55781 (September 11, 2013)),

and residential furnace fans (78 FR 64067 (October 25, 2013)). The analyses prepared for these rulemakings used values for the SCC that were developed by an interagency group and issued by OMB in May 2013.¹ The May 2013 estimates reflect values that are similar to those used by other governments, international institutions, and major corporations. Table 1 shows the May 2013 sets of SCC estimates in five year increments from 2010 to 2050. The interagency group selected four sets of SCC values for use in regulatory analyses. Three sets of values are based on the average SCC from the three integrated assessment models that were evaluated, at discount rates of 2.5, 3, and 5 percent. The fourth set, which represents the 95th percentile SCC estimate across all three models at a 3-percent discount rate, is included to represent higher-than-expected impacts from temperature change further out in the tails of the SCC distribution.

On November 1, 2013, OMB issued updated values for the May 2013 SCC.² OMB announced a 60-day public comment period on the updated values and the underlying technical support document on November 26, 2013. 78 FR 70586. These updated values reflect minor technical corrections to the May 2013 SCC estimates. The technical corrections to the May 2013 SCC values represent the best available science and data on the economic impacts on society of climate change, and , as such, will be used by DOE in its rulemakings. Table 2 shows the updated sets of SCC estimates in five year increments from 2010 to 2050. The changes from the May 2013 values to the November 2013 values are small.

Table 1. Annual SCC Values from May 2013 Interagency Report, 2010–2050 (2007 dollars per metric ton CO₂)

¹ Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866. Interagency Working Group on Social Cost of Carbon, United States Government. May 2013.

² <http://www.whitehouse.gov/blog/2013/11/01/refining-estimates-social-cost-carbon>

Year	Discount Rate %			
	5	3	2.5	3
	Average	Average	Average	95 th Percentile
2010	11	33	52	90
2015	12	38	58	109
2020	12	43	65	129
2025	14	48	70	144
2030	16	52	76	159
2035	19	57	81	176
2040	21	62	87	192
2045	24	66	92	206
2050	27	71	98	221

Table 2. Annual SCC Values from November 2013 Interagency Report Update, 2010–2050 (2007 dollars per metric ton CO₂)

Year	Discount Rate %			
	5	3	2.5	3
	Average	Average	Average	95 th Percentile
2010	11	32	51	89
2015	11	37	57	109
2020	12	43	64	128
2025	14	47	69	143
2030	16	52	75	159
2035	19	56	80	175
2040	21	61	86	191
2045	24	66	92	206
2050	26	71	97	220

II. Discussion

As indicated above, the updated SCC values are only slightly different from the May 2013 SCC values. As such, the impact of using these values on DOE's estimates of the economic value of reductions in CO₂ emissions associated with the energy conservation standards for the products mentioned in section I is very small, and in no way affects the policy decisions made by DOE in the relevant rulemakings. Nonetheless, DOE wishes to inform interested parties of the

exact effect of the updated values on the national economic benefits projected to result from the proposed standards for commercial refrigeration equipment, walk-in coolers and freezers, metal halide lighting fixtures, and residential furnace fans. The benefits of reductions in CO₂ emissions associated with energy conservation standards using the May 2013 SCC values and the updated SCC values, along with the total net benefits in each case, are shown in: Table 3 for the proposed metal halide lighting fixtures standards (in real 2012 dollars); Table 4 for the proposed commercial refrigeration equipment standards (in real 2012 dollars); Table 5 for the proposed walk-in coolers and freezers standards (in real 2012 dollars); and Table 6 for the proposed residential furnace fans standards (in real 2012 dollars). Given the small change in the benefits, DOE has, in this notice, only shown the summary National impacts of the changes and not the results at the more detailed trial standard levels (TSLs). However, DOE notes that the changes at the Trial Standard Level (TSL) level are equally small and do not in any way affect DOE's evaluation of those TSLs. ³

³ In DOE rulemakings, "TSLs" represent different efficiency levels that DOE analyzes when deciding which efficiency level to propose or adopt based on statutory criteria.

Table 3. Summary of National Economic Benefits and Costs of Proposed Metal Halide Lamp Fixture Energy Conservation Standards⁴

Category	Present Value (Million 2012\$)	Discount Rate
Benefits		
Operating Cost Savings	1,848	7%
	3,748	3%
<u>Using Revised November 2013 Social Cost of Carbon Values</u>		
CO ₂ Reduction Monetized Value (\$11.8/t case)*	332	5%
CO ₂ Reduction Monetized Value (\$39.7/t case)*	1,514	3%
CO ₂ Reduction Monetized Value (\$61.2/t case)*	2,406	2.5%
CO ₂ Reduction Monetized Value (\$117/t case)*	4,666	3%
NO _x Reduction Monetized Value (at \$2,639/ton)*	45	7%
	91	3%
Total Benefits†	3,406	7%
	5,352	3%
<u>Using Original May 2013 Social Cost of Carbon Values</u>		
CO ₂ Reduction Monetized Value (\$12.9/t case)*	333	5%
CO ₂ Reduction Monetized Value (\$40.8/t case)*	1,532	3%
CO ₂ Reduction Monetized Value (\$62.2/t case)*	2,436	2.5%
CO ₂ Reduction Monetized Value (\$117/t case)*	4,689	3%
NO _x Reduction Monetized Value (at \$2,639/ton)*	45	7%
	91	3%
Total Benefits†	3,424	7%
	5,371	3%
Costs		
Incremental Installed Costs	897	7%
	1,294	3%
Net Benefits (using Revised November 2013 SCC values)		
Including CO ₂ and NO _x Reduction Monetized Value	2,510	7%
	4,058	3%
Net Benefits (using Original May 2013 SCC values)		
Including CO ₂ and NO _x Reduction Monetized Value	2,528	7%
	4,076	3%

* The CO₂ values represent global values of the social cost of CO₂ emissions (in 2012\$) in 2015 under several scenarios. The first three values are averages of SCC distributions calculated using 5%, 3%, and 2.5% discount rates, respectively. The fourth value represents the 95th percentile of the SCC distribution calculated using a 3% discount rate. The value for NO_x is the average of the low and high values used in DOE's analysis.

† Total Benefits for both the 3% and 7% cases are derived using the series corresponding to SCC value of \$39.7/t or \$40.8/t in 2015 (derived from the 3% discount rate value for SCC).

⁴ See Table I.3 at 78 FR 51463, 51468 (August 20, 2013).

Table 4. Summary of National Economic Benefits and Costs of Proposed Commercial Refrigeration Equipment Energy Conservation Standards⁵

Category	Present Value (Million 2012\$)	Discount Rate
Benefits		
Operating Cost Savings	2,695	7%
	6,034	3%
<u>Using Revised November 2013 Social Cost of Carbon Values</u>		
CO ₂ Reduction Monetized Value (\$11.8/t case)*	306	5%
CO ₂ Reduction Monetized Value (\$39.7/t case)*	1,481	3%
CO ₂ Reduction Monetized Value (\$61.2/t case)*	2,418	2.5%
CO ₂ Reduction Monetized Value (\$117/t case)*	4,527	3%
NO _x Reduction Monetized Value (at \$2,639/ton)*	50	7%
	108	3%
Total Benefits†	4,226	7%
	7,623	3%
<u>Using Original May 2013 Social Cost of Carbon Values</u>		
CO ₂ Reduction Monetized Value (\$12.9/t case)*	308	5%
CO ₂ Reduction Monetized Value (\$40.8/t case)*	1,504	3%
CO ₂ Reduction Monetized Value (\$62.2/t case)*	2,452	2.5%
CO ₂ Reduction Monetized Value (\$117/t case)*	4,552	3%
NO _x Reduction Monetized Value (at \$2,639/ton)*	50	7%
	108	3%
Total Benefits†	4,249	7%
	7,646	3%
Costs		
Incremental Installed Costs	1,089	7%
	1,967	3%
Net Benefits (using Revised November 2013 SCC values)		
Including CO ₂ and NO _x Reduction Monetized Value	3,137	7%
	5,656	3%
Net Benefits (using Original May 2013 SCC values)		
Including CO ₂ and NO _x Reduction Monetized Value	3,160	7%
	5,679	3%

* The CO₂ values represent global values of the social cost of CO₂ emissions (in 2012\$) in 2015 under several scenarios. The first three values are averages of SCC distributions calculated using 5%, 3%, and 2.5% discount rates, respectively. The fourth value represents the 95th percentile of the SCC distribution calculated using a 3% discount rate. The value for NO_x is the average of the low and high values used in DOE's analysis.

† Total Benefits for both the 3% and 7% cases are derived using the series corresponding to SCC value of \$39.7/t or \$40.8/t in 2015 (derived from the 3% discount rate value for SCC).

⁵ See Table I.3 at 78 FR 55889, 55893 (September 11, 2013).

Table 5. Summary of National Economic Benefits and Costs of Proposed Walk-in Coolers and Freezers Energy Conservation Standards⁶

Category	Present Value (Billion 2012\$)	Discount Rate
Benefits		
Operating Cost Savings	12.41	7%
	31.56	3%
<u>Using Revised November 2013 Social Cost of Carbon Values</u>		
CO ₂ Reduction Monetized Value (\$11.8/t case)*	1.87	5%
CO ₂ Reduction Monetized Value (\$39.7/t case)*	8.87	3%
CO ₂ Reduction Monetized Value (\$61.2/t case)*	14.19	2.5%
CO ₂ Reduction Monetized Value (\$117/t case)*	27.39	3%
NO _x Reduction Monetized Value (at \$2,639/ton)*	0.24	7%
	0.55	3%
Total Benefits†	21.52	7%
	40.98	3%
<u>Using Original May 2013 Social Cost of Carbon Values</u>		
CO ₂ Reduction Monetized Value (\$12.9/t case)*	1.88	5%
CO ₂ Reduction Monetized Value (\$40.8/t case)*	8.96	3%
CO ₂ Reduction Monetized Value (\$62.2/t case)*	14.36	2.5%
CO ₂ Reduction Monetized Value (\$117/t case)*	27.52	3%
NO _x Reduction Monetized Value (at \$2,639/ton)*	0.24	7%
	0.55	3%
Total Benefits†	21.61	7%
	41.07	3%
Costs		
Incremental Installed Costs	3.77	7%
	7.26	3%
Net Benefits (using Revised November 2013 SCC values)		
Including CO ₂ and NO _x Reduction Monetized Value	17.76	7%
	33.72	3%
Net Benefits (using Original May 2013 SCC values)		
Including CO ₂ and NO _x Reduction Monetized Value	17.84	7%
	33.80	3%

* The CO₂ values represent global values of the social cost of CO₂ emissions (in 2012\$) in 2015 under several scenarios. The first three values are averages of SCC distributions calculated using 5%, 3%, and 2.5% discount rates, respectively. The fourth value represents the 95th percentile of the SCC distribution calculated using a 3% discount rate. The value for NO_x is the average of the low and high values used in DOE's analysis.

† Total Benefits for both the 3% and 7% cases are derived using the series corresponding to SCC value of \$39.7/t or \$40.8/t in 2015 (derived from the 3% discount rate value for SCC).

⁶ See Table I-3 at 78 FR 55781, 55786-87 (September 11, 2013).

Table 6. Summary of National Economic Benefits and Costs of Proposed Furnace Fan Energy Conservation Standards⁷

Category	Present Value (Billion 2012\$)	Discount Rate
Benefits		
Operating Cost Savings	11.58	7%
	32.00	3%
<u>Using Revised November 2013 Social Cost of Carbon Values</u>		
CO ₂ Reduction Monetized Value (\$11.8/t case)*	2.22	5%
CO ₂ Reduction Monetized Value (\$39.7/t case)*	11.44	3%
CO ₂ Reduction Monetized Value (\$61.2/t case)*	18.60	2.5%
CO ₂ Reduction Monetized Value (\$117/t case)*	35.42	3%
NO _x Reduction Monetized Value (at \$2,639 /ton)*	0.11	7%
	0.31	3%
Total Benefits†	23.13	7%
	43.76	3%
<u>Using Original May 2013 Social Cost of Carbon Values</u>		
CO ₂ Reduction Monetized Value (\$12.9/t case)*	2.25	5%
CO ₂ Reduction Monetized Value (\$40.8/t case)*	11.52	3%
CO ₂ Reduction Monetized Value (\$62.2/t case)*	18.81	2.5%
CO ₂ Reduction Monetized Value (\$117/t case)*	35.56	3%
NO _x Reduction Monetized Value (at \$2,639/ton)*	0.11	7%
	0.31	3%
Total Benefits†	23.21	7%
	43.84	3%
Costs		
Incremental Installed Costs	3.07	7%
	5.85	3%
Net Benefits (using Revised November 2013 SCC values)		
Including CO ₂ and NO _x Reduction Monetized Value	20.06	7%
	37.91	3%
Net Benefits (using Original May 2013 SCC values)		
Including CO ₂ and NO _x Reduction Monetized Value	20.14	7%
	38.99	3%

* The CO₂ values represent global values of the social cost of CO₂ emissions (in 2012\$) in 2015 under several scenarios. The first three values are averages of SCC distributions calculated using 5%, 3%, and 2.5% discount rates, respectively. The fourth value represents the 95th percentile of the SCC distribution calculated using a 3% discount rate. The value for NO_x is the mid-range value used in DOE's analysis.

† Total Benefits for both the 3% and 7% cases are derived using the series corresponding to SCC value of \$39.7/t or \$40.8/t in 2015 (derived from the 3% discount rate value for SCC).

⁷ See Table 1.3 at 78 FR 64067, 64071 (October 25, 2013).

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